

## **REMARKS**

### ***Overview:***

In the non-final Office Action under reply, claims 1-6, 8, 9, 12, 13, 17-24, and 43-52 were examined, claims 7, 10, 11, 14-16, and 25-42 having been previously canceled. Applicants acknowledge with appreciation the withdrawal of the rejections from the previous Action (i.e., of claims 1-6, 8, 9, 12, 13, 17-24, and 45 under 35 U.S.C. §112, 1<sup>st</sup> and 2<sup>nd</sup> paragraphs, as well as claims 46 and 47 under 35 U.S.C. §112, 1<sup>st</sup> paragraph). The examined claims stand rejected as follows:

(1) claims 1-6, 8, 9, 12, 13, 17, 19, and 21-24 are rejected under 35 U.S.C. §112, 1<sup>st</sup> paragraph, because the specification does not enable any person skilled in the art to practice the invention commensurate in scope with the claims;

(2) claims 1-3, 8, 18, and 19 are rejected under 35 U.S.C §102(b) as anticipated by Uozumi et al., (1997) *J. Am. Chem. Soc.*, 119, 5063-5064 (hereinafter "Uozumi");

(3) claims 1-3, 18, and 21-24 are rejected under 35 U.S.C §103(a) as unpatentable over Uozumi in view of Hosokawa et al., (1981) *J. Am. Chem. Soc.*, 103, 2318-2323 (hereinafter "Hosokawa").

The rejections of the Action under reply are overcome for at least the reasons set forth below.

### ***Claim amendments:***

By the amendment made herein, claim 24 has also been amended to eliminate reference to a nucleophilic atom. No new matter has been added by this amendment.

### ***Rejection under 35 U.S.C. §112, 1<sup>st</sup> paragraph:***

Claims 1-6, 8, 9, 12, 13, 17, 19, and 21-24 stand rejected under 35 U.S.C. §112, 1<sup>st</sup> paragraph, because "the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims." The Examiner acknowledges that the specification is enabling for the "enantioselective oxidation of secondary alcohols." The Examiner asserts, however, that the "enantioselective oxidation of other organic systems by using the same chiral catalyst claimed in the instant application" is not enabled by the specification. This rejection is traversed.

Applicants acknowledge with appreciation the Examiner's recognition that the specification is enabling for the enantioselective oxidation of secondary alcohols, and further submit that the specification is enabling for oxidizable, chiral organic compounds in general.

The Examiner states on page 4 of the Action that "a catalyst comprising of [sic] Pd, and a chiral ligand containing two or more tertiary N-atoms separated by two or more linking atoms is rather unclear." Based on the specification, however, one of ordinary skill in the art would have no difficulty envisioning the scope of catalysts that are encompassed by the claims. The specification provides an extensive description (e.g., paragraphs [00033] - [00040]) of catalysts, as well as several specific examples (e.g., on pages 20-21). A wide variety of appropriate catalyst ligands are well known in the art, sold commercially, and/or documented in the pertinent literature. Furthermore, the language of the claims is quite clear: *immediately upon inspection* one of ordinary skill in the art would be able to determine whether a given ligand structure contains two or more tertiary N-atoms, and whether the tertiary N-atoms are separated by two or more linking atoms. With any given ligand structure, therefore, there is no ambiguity as to whether that ligand structure satisfies the limitation of the claims.

The Examiner further rejects the claims on the ground that "[a]ll of the guidance provided by the specification is directed towards enantioselective oxidation of the secondary alcohols... rather than the enantioselective oxidation of the other organic systems claimed in the instant application." On this point, applicants refer to MPEP §2164.01(b), which states that "[a]s long as the specification discloses at least one method for making and using the claimed invention that bears a *reasonable correlation* to the entire scope of the claim, then the enablement requirement of 35 U.S.C. 112 is satisfied. *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970)" (emphasis added). Pending claim 1 is directed toward reactants comprising oxidizable, chiral organic compounds. The Examiner has acknowledged that the specification is enabling with respect to secondary alcohols, and it would be a simple matter for one of ordinary skill in the art to apply the teachings of the application in reactions with other compounds. One of ordinary skill in the art would recognize that the teachings of the application are applicable to a very wide range of compounds, and that testing individual compounds is simply a matter of routine experimentation using the methods described in the specification. The guidance for catalyst selection provided by the specification is sufficient for a skilled artisan to select and test catalyst systems with any oxidizable, chiral organic compound.

Applicants further note that numerous examples of oxidation reactions are provided in the original specification. For example, pages 12-17 of the specification describe Wacker-type cyclizations, enantioselective aromatic oxidations, enantio-group differentiation of meso diols, enantioselective oxidative [4+2] cycloadditions, C-C bond forming cyclizations, and enantioselective oxidative cyclizations. Example reactants are provided for each of these reactions; such examples range from secondary alcohols and primary alcohols (compounds VIII.1 and IV.1, respectively) to N-heterocyclic compounds (compound VII.1). One of skill in the art would therefore find sufficient guidance in the specification to apply the methods of the invention to a wide range of oxidizable, chiral organic compounds.

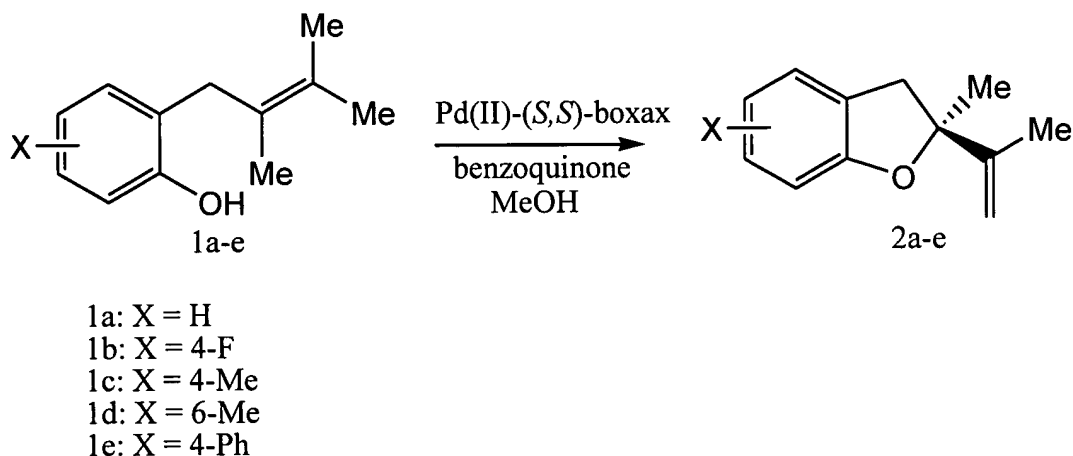
The Examiner states that the “state of the art is relatively high with regard to enantioselective oxidation of secondary alcohols,” but that “different organic systems with varied functional groups are expected to behave in a different manner.” It is axiomatic that each organic compound behaves uniquely. *It should be clear, however, that if a catalyst is established to effectively catalyze a particular oxidation reaction, that catalyst would effectively catalyze other reactions following the same reaction mechanism.* In other words, it can be presumed that the catalyst will remain effective when the only modification to a specifically described reaction is a change that does not affect the way the reaction proceeds (e.g., a change in reactants). Therefore, the guidance provided in the specification, which is acknowledged to be enabling for secondary alcohols, can be applied to oxidizable, chiral organic compounds in general. One of ordinary skill would understand that the methods and catalysts described in the specification are effective with alcohols as well as other oxidizable, chiral organic compounds.

Accordingly, applicants submit that the specification enables the full scope of the originally filed and amended claims, and therefore respectfully request withdrawal of the rejection.

***Rejection under 35 U.S.C. §102(b):***

Claims 1-3, 8, 18, and 19 stand rejected under 35 U.S.C §102(b) as anticipated by Uozumi. The Examiner cites Uozumi for disclosing Wacker type cyclization of O-allylphenols by use of Palladium(II) catalysts coordinated with bis(oxazoline) ligands. This rejection is traversed.

Uozumi is directed to catalytic asymmetric Wacker-type cyclization reactions that involve a phenol-type compound as reactant. Particularly, Uozumi studies the importance of catalyst and reaction conditions for the following reaction:



The instant claim 1, in contrast, requires “an oxidizable, *chiral* organic compound composed of a racemic mixture of a first enantiomer and a second enantiomer,” and further requires “selectively oxidizing the first enantiomer of the organic compound so as to produce (i) an oxidized organic compound and (ii) *a mixture of the first and second enantiomers in which the second enantiomer represents at least 50% of the mixture*” (emphasis added).

According to MPEP §706.02(IV), anticipation under 35 U.S.C. §102 requires that the reference “teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present.” Clearly, Uozumi fails to teach every aspect of the claimed invention. The phenolic reactants (compounds 1a-e) in the reaction of Uozumi, shown above, are *achiral*. Uozumi does not disclose chiral organic compounds, and, accordingly, does not disclose any reactions that satisfy the limitations of the instant claims with respect to the reactants. Furthermore, since the reactants are achiral, the products of the reaction shown above cannot include “a mixture of the first and second enantiomers,” as required by the instant claims. Indeed, Uozumi does not mention any products except for compounds 2a-e, shown above. The products of the methods of Uozumi do not include a mixture of the first and second enantiomers, and therefore the methods of Uozumi do not satisfy the limitations of the instant claims with respect to the products. In light of the differences between Uozumi and the instant claims, applicants respectfully request withdrawal of the rejection.

***Rejection under 35 U.S.C. §103(a):***

Claims 1-3, 18, and 21-24 stand rejected under 35 U.S.C §103(a) as unpatentable over Uozumi in view of Hosokawa.

The combination of Uozumi and Hosokawa is not sufficient for a *prima facie* case of obviousness. The MPEP (§2142) lists three criteria, all of which must be met in order for there to be a *prima facie* case of obviousness:

“First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.”

Uozumi is discussed above, where it is noted that Uozumi fails to teach the claimed invention. Claim 1 recites, in part, an “oxidizable, *chiral* organic compound composed of a racemic mixture of a first enantiomer and a second enantiomer” (emphasis added). Uozumi is limited to phenol-type reactants that are *not chiral*. Furthermore, Uozumi does not include reactions wherein the products include a mixture of the first and second enantiomers.

Hosokawa does not provide the teachings that are absent in Uozumi. Hosokawa is directed to palladium(II) catalyzed asymmetric oxidative cyclization of 2-allylphenols. As with Uozumi, all of the reactants of Hosokawa are phenolic compounds. Accordingly, as with Uozumi, none of the reactions of Hosokawa include as reactants an oxidizable, chiral organic alcohol composed of a racemic mixture of a first enantiomer and a second enantiomer, as required by the instant claim 1. Furthermore, as with Uozumi, none of the reactions in Hosokawa produce products that comprise a mixture of the first and second enantiomers, which is also required by claim 1. Clearly, one of ordinary skill in the art would not find in Hosokawa the teachings that are missing from Uozumi. Indeed, the combination of Uozumi and Hosokawa fails to teach or suggest all of the claim limitations, which is required in order for the combination to provide a *prima facie* case of obviousness. Accordingly, the combination of Uozumi and

Hosokawa does not present a *prima facie* case of obviousness, and applicants respectfully request withdrawal of the rejection.

**CONCLUSION**

Applicants respectfully request the issuance of a Notice of Allowance. If the Examiner has any questions concerning this communication, she is welcome to contact the undersigned at the telephone number below.

Respectfully submitted,

By:



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